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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/727,555	12/05/2003	Yasunaga Hamada	056208.49740D1	8868

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EXAMINER	
KEASEL, ERIC S	
ART UNIT	**PAPER NUMBER**
3754	

DATE MAILED: 03/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/727,555	HAMADA ET AL.	
	Examiner	Art Unit	
	Eric Keasel	3754	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *9-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *9-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 12/5/03, 2/1/05, 7/12/05, 1/17/06
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Preliminary Amendment

1. The preliminary amendment canceling claims 1-8 is acknowledged.

Information Disclosure Statement

2. Various references from the first IDS have been repeated on the second and third IDSs. The duplicate listings on the second and third IDSs have been deleted.

Specification

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

4. The abstract of the disclosure is objected to because it is two paragraphs and exceeds 150 words. Correction is required. See MPEP § 608.01(b).

Claim Objections

5. The claims are objected to because they are generally narrative in form and appear to be a literal translation into English from a foreign document. For example, idiomatic phrases, such as, "on the other hand" generally do not conform to US practice. Also, some translated terms, such as, "magnetic suction" have more appropriate English terminology (i.e. "magnetic attraction). Appropriate correction is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

7. Claims 9 and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by Yamakado et al. (US Patent Number 6,332,453). See Fig. 1A of '453 and compare with Fig. 1A of the present application. The applied reference has a common inventor and/or assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

8. Claims 12 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamakado et al. (DE 198 28 672, US Patent Number 5,992,391 used as a translation).

Yamakado et al. discloses an electromagnetic fuel injector for an internal combustion engine characterized in that said electromagnetic fuel injector comprises a first coil in which a large current flows in a short time during the rising of the valve opening operation so as to secure magnetomotive force necessary to open the valve, a second coil in which a relatively small current flows so as to secure magnetomotive force to hold the opening state of the valve, and a connector having three terminals, and said first coil and said second coil are connected to the power source and two switching elements for energizing control by the three terminals, and wherein among the three terminals, the first terminal connects one end of the first coil and one end of the second coil to the power source, and the second terminal connects the other end of the first coil to the first switching element, and the third terminal connects the other end of the second coil to the second switching element.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Strohschein (US Patent Number 5,516,424) in view of Yamakado et al. (DE 198 28 672, US Patent Number 5,992,391 used as a translation).

Strohschein discloses an electromagnetic fuel injector wherein an annular space formed between a stationary core (9) arranged at the center part of the main body of the injector and a cylindrical yoke (45, 50, 16) arranged in the outside of the stationary core, and the space between said stationary core and said yoke is sealed by a seal ring (12), characterized in that a bobbin (3, 15) has a step difference of the outer diameter so that the bobbin outer diameter in the region with the first coil wound thereon, and said bobbin has a step difference of the inner diameter (15) so that the bobbin inner diameter in the region with the first coil wound thereon is made large partially so as to secure the annular space for interposing said seal ring. Strohschein fails to disclose the two types of electromagnetic coils different in characteristics, wherein said coils are wound separately in the axial direction on one bobbin, and among them, one coil has a winding region near a movable unit with a valve element being the object of magnetic suction, and the other coil has a winding region remote from the movable unit, wherein said first and second coils are set so that said first coil has the large wire diameter and the number of turns being little and a

large current flows in comparison with the second coil, and magnetomotive force necessary to move the valve from the closing position to the opening position is generated by the first coil, and magnetomotive force to hold the valve opening state is generated by the second coil. Yamakado et al. disclose a similar fuel injection valve with two types of electromagnetic coils different in characteristics, wherein said coils are wound separately in the axial direction on one bobbin, and among them, one coil has a winding region near a movable unit with a valve element being the object of magnetic suction, and the other coil has a winding region remote from the movable unit, wherein said first and second coils are set so that said first coil has the large wire diameter and the number of turns being little and a large current flows in comparison with the second coil, and magnetomotive force necessary to move the valve from the closing position to the opening position is generated by the first coil, and magnetomotive force to hold the valve opening state is generated by the second coil. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the dual coil system of Yamakado et al. with the fuel injector of Strohschein in order so that the first magnetomotive force generates and raises its magnetomotive force at a larger rate of change in time in comparison with the second magnetomotive force generating device and a valve open state is held by the second magnetomotive force generating device which uses a smaller current flow in comparison with the first magnetomotive force generating device as taught by Yamakado et al.

11. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Strohschein in view of Yamakado et al. as applied to claim 9 above, and further in view of Shirabe et al. JP62-225760).

The modified Strohschein is silent as bobbin being molded by a synthetic resin containing a filler of good heat conductivity. Shirabe et al. disclose a similar fuel injector with the as bobbin being molded by a synthetic resin containing a filler of good heat conductivity. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have made the bobbin of a synthetic resin containing a filler of good heat conductivity in order to have satisfactory heat transmission so that the temperature of the coil is restrained from increasing as taught by Shirabe et al.

12. Claims 13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamakado et al. (DE 198 28 672, US Patent Number 5,992,391 used as a translation) in view of Hoshi (US Patent Number 4,154,198).

Yamakado et al. discloses an electromagnetic fuel injector for an internal combustion engine characterized in that said electromagnetic fuel injector comprises a first coil in which a large current flows in a short time during the rising of the valve opening operation so as to secure magnetomotive force necessary to open the valve, a second coil in which a relatively small current flows so as to secure magnetomotive force to hold the opening state of the valve, and a connector having three terminals, and said first coil and said second coil are connected to the power source and two switching elements for energizing control by the three terminals, and wherein among the three terminals, the first terminal connects one end of the first coil and one

end of the second coil to the power source, and the second terminal connects the other end of the first coil to the first switching element, and the third terminal connects the other end of the second coil to the second switching element. Yamakado et al. fail to disclose that among the three terminals, the first terminal connects one end of the first coil to the power source, and the second terminal connects other end of the first coil to the first switching element and also to one end of the second coil, and the third terminal connects end of the second coil, and the third terminal connects other end of the second coil to the second switching element. Yamakado et al. also fail to disclose the shape of the terminal having a curved part. Hoshi discloses a similar fuel injector the first terminal connecting one end of the first coil to the power source, and the second terminal connecting the other end of the first coil to the first switching element and also to one end of the second coil, and the third terminal connecting end of the second coil, and the third terminal connects other end of the second coil to the second switching element. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the control circuit of Hoshi with the fuel injector of Yamakado et al. in order to improve responsiveness as taught by Hoshi. The examiner takes official notice that putting a curved part in the terminal is old and well known in the art for reasons that are old and well known in the art.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Holmes et al. and Wahba discloses similar valves.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric Keasel whose telephone number is (571) 272-4929. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Mar can be reached on (571) 272-4906. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Eric Keasel 3 MAR 2006

Eric Keasel
Primary Examiner
Art Unit 3754